

ABSTRACT

A method of incorporating effects of solid dynamic objects into each discrete time step of a fluid simulation in a high quality fashion on Cartesian grids. The method relies on modifying the fluid velocity field within regions internal to the solid objects prior to the calculation of advection and pressure effects such that the sub voxel details of the solid objects are accurately represented. The modification of the velocities is based on allowing maximal freedom of fluid movement under the constraints the occlusions impose. Additionally, the solid objects are optionally represented in a unified level set fashion such that the computations required for modifying the fluid velocity are efficient. The overall result of this improved method rivals the quality of that achieved with the more complex curvilinear grid approach.